

The Ins and Outs of Large Scale Asset Purchases

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Question: How to optimally manage an exit?

Exit = Cessation of purchases and/or sale of Fed portfolio

1. Mechanics: Which asset prices will be most affected? Are sales and cessation of purchases conceptually different?
2. Expectations: How do exit announcements affect dynamics of asset prices?

Note:

We do not discuss whether or not exit is currently optimal.

We study how to optimally manage an exit.

RESULTS

Mechanics:

- i. Purchases (sales) mostly affect the price of the assets purchased
 - a. Treasury purchases lower government borrowing rates, with limited private sector spillover
 - b. MBS purchases lower household mortgage rates
- ii. MBS purchases: “cheapest to deliver” scarcity channel.
 - a. Key factor is expected flow of purchases; *Cessation ≠ Sales*

Optimal exit sequence:

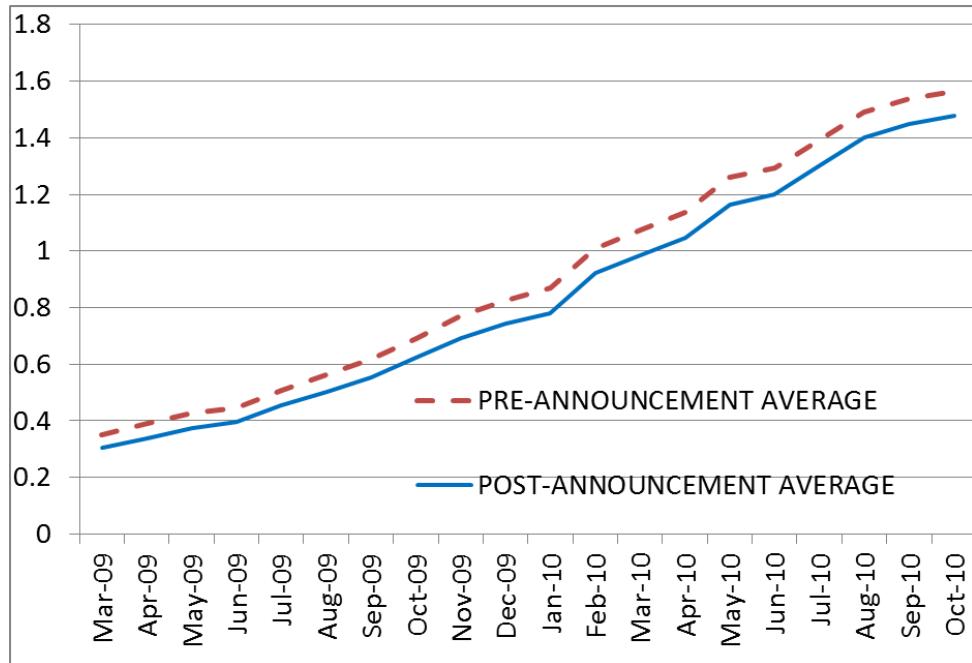
1. Cease Treasury purchases;
2. Sell Treasury portfolio;
3. Sell older MBS;
4. Cease new MBS purchases

Expectations and Policy Rule:

- iii. LSAPs target the prices of long-term assets (conventional monetary policy targets short-term assets)
 - a. Long-term asset prices are forward looking
 - b. Asset prices highly sensitive to expectations over LSAP evolution
- iv. Exit Rules versus Discretion
 - a. Fed has chosen discretion for LSAPs based on uncertainties over LSAP transmission mechanism
 - b. Rules matter more for LSAPs. Uncertainties also with low rate policy.
 - c. Why not lay out LSAP exit (and entry) rule?

Mechanics: Purchases mostly affect the price of the assets purchased

Strip out signaling effects using fed funds futures contracts “shift”



Notes for figure

- Yield curves from fed funds futures, pre- and post-QE1 event days
- Shift of one-month, indicates each QE1 announcement shifted expectations of rate hike by one-month.

Table 1. Changes in Asset Prices around QE1, QE2, MEP and QE3 Event Dates^a

Basis points

| | Events | | | |
|------------------------------------|--------------------------|----------------------|--------------------------|-----------------|
| | QE1 MBS & Treasury | QE2 Treasury only | MEP MBS & Treasury | QE3 MBS only |
| <i>Treasury Yields (CMT)</i> | | | | |
| 5-year | -74 | -17 | +3 | -6 |
| 10-year | -107 | -18 | -7 | -3 |
| 30-year | -73 | -9 | -17 | 1 |
| <i>Inflation Swaps</i> | | | | |
| 10-year | 96 | 5 | -4 | 3 |
| <i>Corporate Bonds^b</i> | | | | |
| Aaa | -77 | -9 | -15 | 3 |
| Baa | -81 | -7 | -17 | 1 |
| Aaa CDS | -7 | 2 | | |
| Baa CDS | -40 | 2 | | |
| IG CDS 5 year | | | +8 | -5 |
| <i>Agency MBS^c</i> | | | | |
| 15-year | -88 | -9 | -7 | -16 |
| 30-year | -107 | -12 | -23 | -16 |
| <i>Swaption vol^d</i> | -38 | -3 | +2 | -1 |
| <i>Fed Funds Futures</i> | | | | |
| 12 th month | -33 | -4 | 0 | 0 |
| 24 th month | -40 | -11 | -1 | -3 |
| <i>Implied Signaling Effect</i> | | | | |
| 5-year | -35 | -18 | 0 | -1 |
| 10-year | -20 | -12 | 0 | -1 |

a. QE1, QE2, MEP event dates are from Krishnamurthy and Vissing-Jorgensen (2011). QE3 event date is September 13, 2012. We give two-day changes for QE1, and one-day changes for QE2, MEP, QE3. Data for QE1 and QE2 are from Krishnamurthy and Vissing-Jorgensen (2011, 2012b).

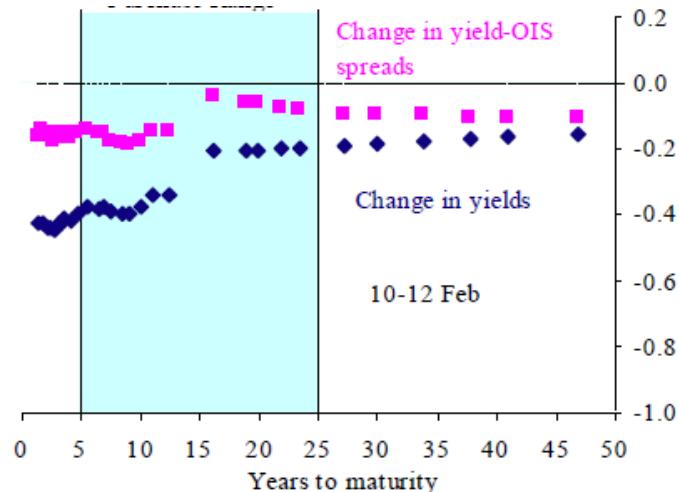
b. For QE3, the corporate yields are the Moody's index and the CDS is the MARKIT IG 5 year CDS.

c. For QE3, we report yield changes averaged across the FNMA and GNMA current coupon MBS.

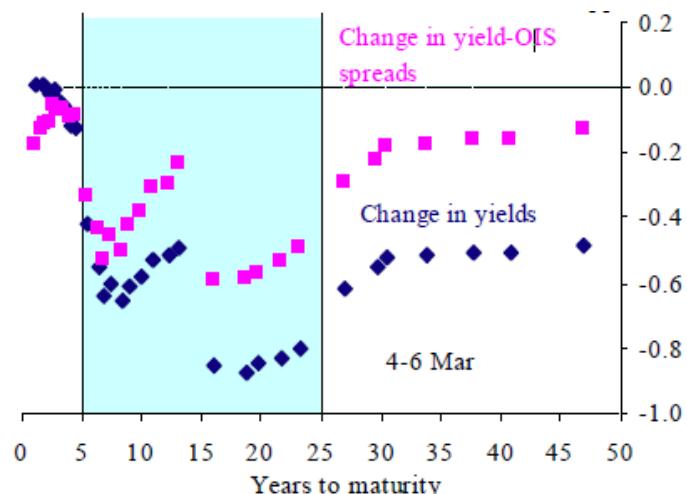
d. Swaption vol is the change in the BBOX index.

Maturity Specific Effects: UK QE

2/10/2009 to 2/12/2009: News of UK QE; Likely < 15 Years



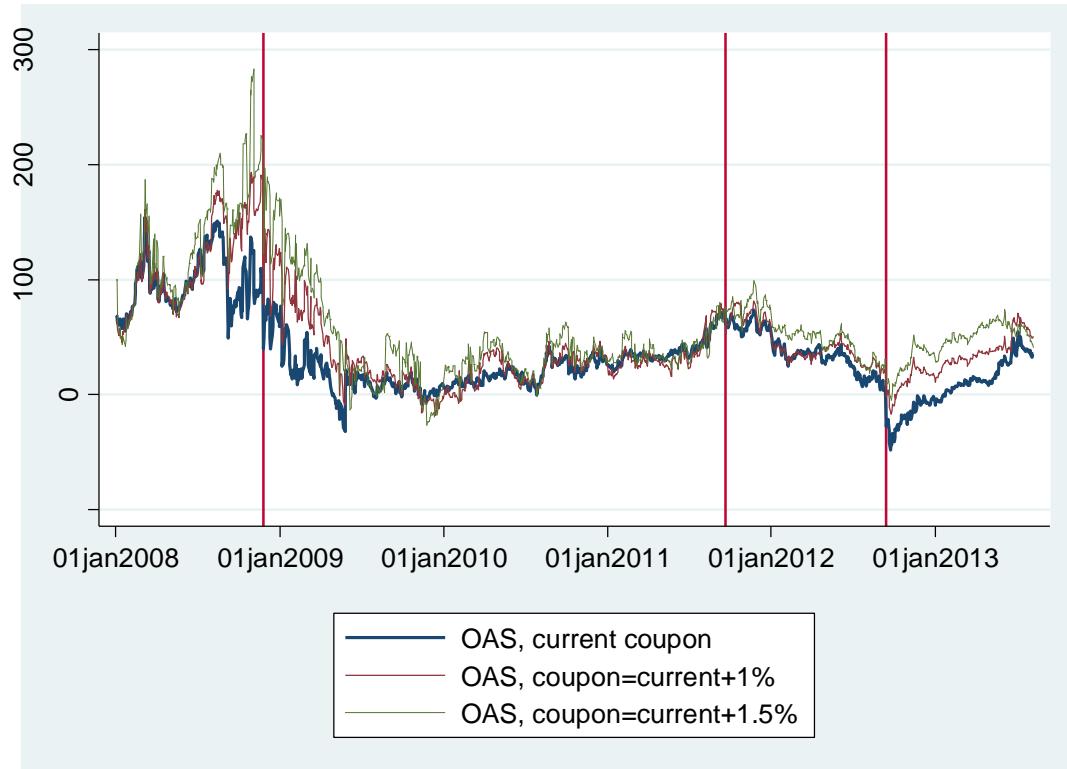
3/4/2009 to 3/6/2009: Clarification of purchases in 5-25 Year Range



Notes for figure:

- Changes in UK Gilt yields and Changes in Gilt-OIS spreads
- Blue area indicates range of purchases, as clarified on 3/5/2009
- Source: Joyce, et. al. (2011)

Mechanics: MBS in Crisis Period (2008/2009) and Non-Crisis Period (2011/2012)

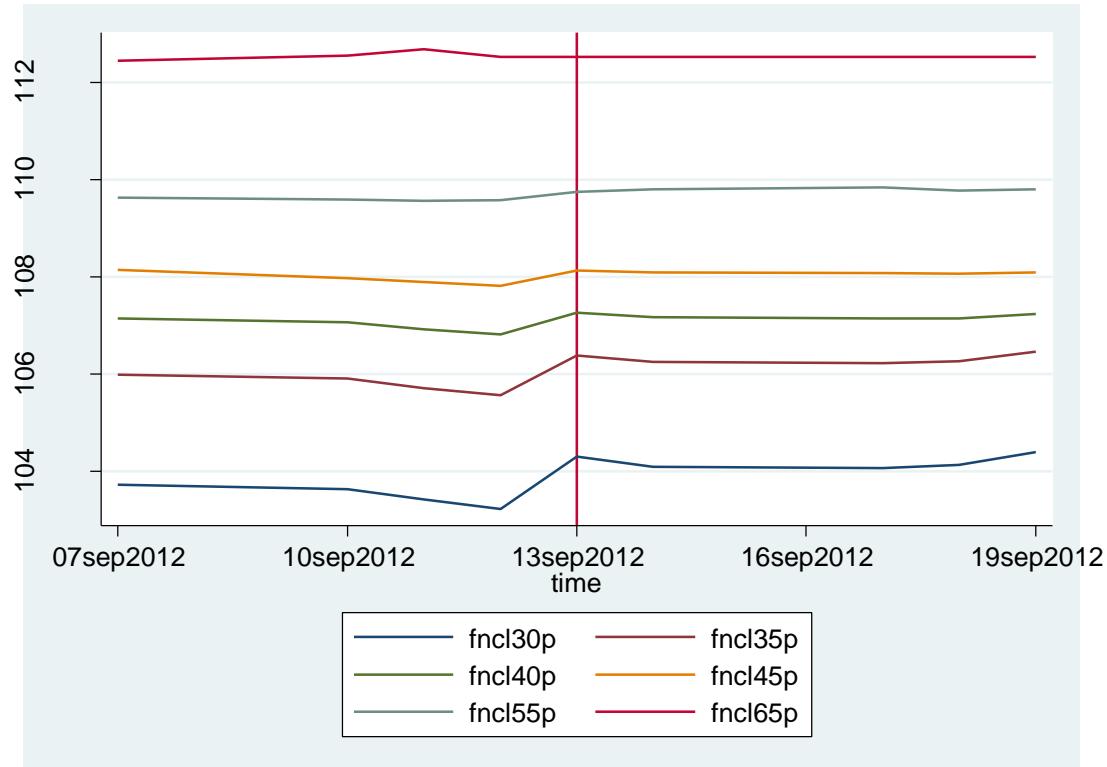


Notes for figure:

- Option adjusted spread (OAS) is measure of risk premium on MBS
- Plotted for FNMA MBS, of three different coupons
- Current coupon == near current mortgage rate
- Fed purchases concentrated around current coupon
- Vertical lines are 11/25/08 (QE1); 9/21/2011 (MEP); 9/13/2012 (QE3)

Mechanics: MBS in Crisis Period (2008/2009) and Non-Crisis Period (2011/2012)

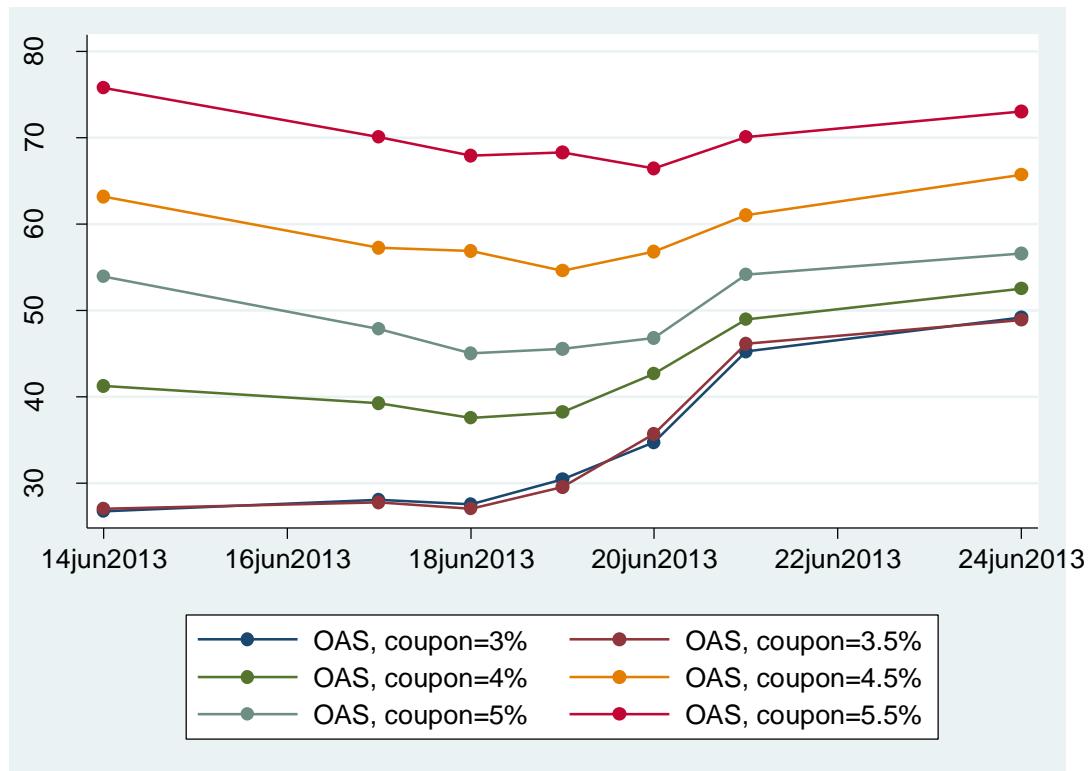
“Cheapest to deliver” scarcity channel



Notes for figure:

- Event study around QE3
- Prices of FNMA MBS, by Coupon, around Sep. 13, 2012 Announcement
- Current coupon = 3, 3.5%
- Low coupon MBS rise in price; No change for high coupon MBS
- Key to identification: No change in general interest rates.

Exit Mechanics: Evidence that Scarcity Channel Operating Currently



Notes for figure:

- Evolution of OAS, June 2013
- Current coupon = 3, 3.5%
- Low coupon MBS OAS rises; Little change for high coupon MBS

Expectations and Exit:

Table 3. Changes in Financial Markets, June 18, 2013 to June 20, 2013

Yields in %, Change in Basis points

| Date | Treasury yields (CMT) | | | Inflation Swaps | | Corporate bonds ^a | | | Agency MBS yields ^b | | Swaption Vol ^c |
|-----------------------------|--------------------------|---------|--------|-----------------|--------|------------------------------|------|----------------|-----------------------------------|---------|------------------------------|
| | 30-year | 10-year | 5-year | 10-year | 5-year | Aaa | Baa | 5-Yr IG CDS | 30-year | 15-year | |
| June 18, 2013 | 3.34 | 2.20 | 1.07 | 2.49 | 2.21 | 4.23 | 5.12 | 82.0 | 2.85 | 2.05 | 95.4 |
| June 20, 2013 | 3.49 | 2.41 | 1.31 | 2.39 | 2.11 | 4.44 | 5.34 | 93.2 | 3.22 | 2.30 | 101.0 |
| Change | 15 | 21 | 24 | -10 | -10 | 21 | 19 | 11.2 | 37 | 25 | 5.6 |
| Implied Signaling Effect | 30-year | 10-year | 7-year | 5-year | | | | | | | |
| Change | 5 | 13 | 17 | 18 | | | | | | | |

a. Corporate bond yields and from Moody's indices. CDS is from the MARKIT Investment Grade CDS index.

b. For 30-year we average across Ginnie Mae 3.5 and Fannie Mae 3. For 15 year we average across Ginnie Mae 2.5 and Fannie Mae 2.5.

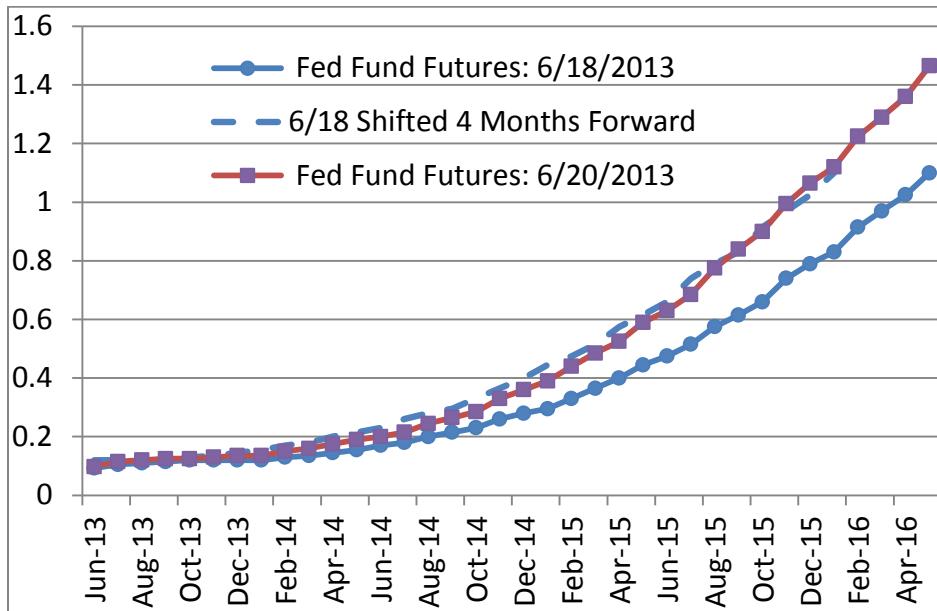
c. Implied volatility in basis points of at-the-money Swaption on 10 year swap, with exercise date in 2 year

Table 2. Holdings of US Treasury Debt, by Holder (in Billions of \$)

Source: Federal Reserve, US Treasury

| | Short-term (<1) | | Medium (1-5) | | Long (>5) | |
|-----------|-----------------|---------|--------------|---------|-----------|---------|
| | Fed | Private | Fed | Private | Fed | Private |
| 30-Jun-08 | \$117 | 1,545 | 173 | 1,389 | 183 | 1,275 |
| 30-Jun-12 | 47 | 2,756 | 516 | 3,710 | 1,092 | 2,335 |
| 30-Jun-13 | 0 | 2,879 | 552 | 4,125 | 1,382 | 2,392 |

Expectations and Exit:



Notes for figure:

- Pre- and post- June 19 FOMC meeting
- Dashed line is curve for 6/18 graphs so that contract months are shifted forward 4 months
- Indicates that expectations shifted towards a tightening cycle beginning 4 months earlier